UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/622,933	07/18/2003	Chee Hong Liau	M&N-IT-465	3481

	EXAMINER
24131 7590 04/10/2007 LERNER GREENBERG STEMER LLP P O BOX 2480 HOLLYWOOD, FL 33022-2480	ALHIJA, SAIF A

ART UNIT	PAPER NUMBER
2128	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/10/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

	Application No.	Applicant(s)
Office Action Summary	10/622,933	LIAU, CHEE HONG
	Examiner	**Art Unit**	
	Saif A. Alhija	2128	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on <u>02 January 2007</u>.

2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) <u>2-7, 23-34, 37 and 38</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) <u>2-7, 23-34, and 37-38</u> is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on <u>18 July 2003</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All b)☐ Some * c)☐ None of:

      1. ☒ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____.

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

1.   Claims 2-7, 23-34, and 37-38 have been presented for examination.

        Claims 1, 8-22, and 35-36 have been cancelled.

Response to Arguments

2.   Applicant's arguments filed 2 January 2007 have been fully considered but they are not

persuasive.

        i)   Applicant arguments with regards to the 101 rejection of the claims are not persuasive.

See rejection below.

        ii)   Applicant argues that the Yao reference does not deal with "a measurement system and

how such a system can be applied to an integrated circuit." Page 1430, left column, paragraph 2 of the

reference recites:

> weights, and train it. The training error will be used to
> measure the fitness. It is worth noting that the ANN in

        Page 1438, Section D, recites:

> system and then used them to train ANN's. Sziranyi
> [99] and Pal and Bhandari [98] used EA's to tune circuit
> parameters and templates in cellular ANN's. Olmez [97]

        The reference discloses tuning circuit parameters as well as measure of fitness which

reads on the claims as presented.

        iii)   Applicant argues that the Yao reference does not disclose adapting the neural network

and then applying the genetic algorithm. As per Applicants statement that:

> the Yao concept is based on the use of the genetic algorithm to help in
>
> adapting the neural network during its learning phase.

        the Examiner notes that Yao discloses both learning and evolution with respect to the

ANN. Further, Section IV of the Yao reference states that the learning rules may be part of the evolution.
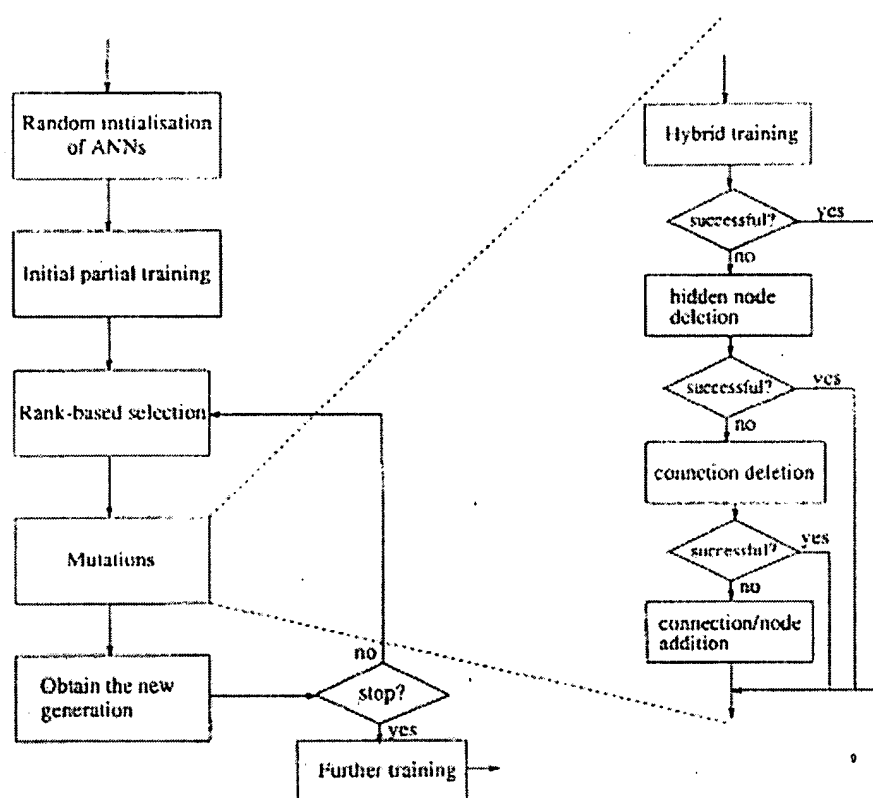
This can be seen also in Fig 11:

Fig. 11. The main structure of EPNet.

As can be seen, for example, the ANN is partially trained first and then can be further

trained. As per Page 1431, left column, second paragraph, the reference further discloses a genetic

encoding scheme for the ANN. The evolution and learning of the ANN in Yao is dynamic and can be

carried out in many different stages. Applicants have not provided the specificity required by the claim to

overcome the nature and mechanism discussed by the Yao reference.

iv)   Examiner has cited particular columns and line numbers in the references applied to the

claims for the convenience of the applicant. Although the specified citations are representative of the

teachings of the art and are applied to specific limitations within the individual claim, other passages and

figures may apply as well. It is respectfully requested from the applicant in preparing responses, to fully

consider the references in their entirety as potentially teaching all or part of the claimed invention, as well

as the context of the passage as taught by the prior art or disclosed by the Examiner.

v)   The Examiner respectfully requests, in the event the Applicants choose to amend or add

new claims, that such claims and their limitations be directly mapped to the specification, which provides

support for the subject matter. This will assist in expediting compact prosecution.

vi)   Further, the Examiner respectfully encourages Applicants to direct the specificity of their

response with regards to this office action to the broadest reasonable interpretation of the claims as

presented. This will avoid issues that would delay prosecution such as limitations not explicitly presented

in the claims, intended use statements that carry no patentable weight, mere allegations of patentability,

and novelty that is not clearly expressed.

PRIORITY

3.   Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d).

Information Disclosure Statement

4.   The information disclosure statements (IDS) submitted on 2 September 2005 and 18 July 2003

are in compliance with the provisions of 37 CFR 1.97. Accordingly, the Examiner has considered the

IDS' as to the merits.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition
> of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the
> conditions and requirements of this title.

MPEP 2106 recites:

The claimed invention as a whole must accomplish a practical application. That is, it must

produce a "useful, concrete and tangible result" State Street 149 F.3d at 1373, 47 USPQ2d at 1601-02. A

process that consists solely of the manipulation of an abstract idea is not concrete or tangibles. See In re

Warmerdam, 33 F.3d 1354, 1360, 31 USPQ2d 1754, 1759 (Fed.Cir. 1994). See also Schrader, 22 F.3d at

295, 30 USPQ2d at 1459.

5.   **Claims 2-7, 23-34, and 37-38 are rejected** under 35 U.S.C. 101 because the claimed invention is

directed to non-statutory subject matter.

i)   The claims recite the steps of processing, applying, determining, providing, adapting, and

comparing. These steps appear to be a manipulation of data and/or software modules. It is unclear if the

resultant of the claims is stored, provided to a user, etc. As such the claims do not produce a useful,

concrete, and tangible result. Further, Applicants amendment recites, "using the new set of test patterns to

test the integrated circuit." This represents an intended use of the claimed limitations and is therefore not

afforded patentable weight.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis

for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or
in public use or on sale in this country, more than one year prior to the date of application for
patent in the United States.

6.   **Claims 2-7, 23-34, and 37-38 are rejected** under 35 U.S.C. 102(b) as being clearly anticipated

by **Yao "Evolving Artificial Neural Networks", hereafter referred to as Yao.**

Regarding Claim 37:

Yao discloses A method of testing an integrated circuit, the method which comprises:

adapting a neural network to approximate a behavior of the integrated circuit, by:

(a) applying a set of test patterns to the integrated circuit; **(Abstract. Page 1438, Section D,**

Circuit Parameters)

(b) applying the set of test patterns to the neural network; **(Abstract. ANN)**

(c) comparing outputs of the integrated circuit and outputs of the neural network to form a

comparison result; **(Page 1424, Section 2, Direct Comparison)** and

(d) adapting parameters of the neural network to approximate the behavior of the integrated

circuit on a basis of the comparison result; **(Abstract. Learning/Evolution)**

subsequently applying further test patterns to the neural network thus adapted; **(Fig. 11. Partial**

Training, Further Training)

processing an output of the neural network to determine whether predetermined criteria are met;

(Page 1424, Section 2, Direct Comparison)

selecting those further test patterns that meet the predetermined criteria; **(Page 1424, Section 2,**

Direct Comparison)

(A) providing a set of test patterns consisting of the selected test patterns; **(Page 1427, Left**

Column, Evolving Connection implementation)

(B) applying the set of selected test patterns to the integrated circuit using automatic test

equipment (ATE); **(Page 1427, Left Column, Evolving Connection implementation)**

(C) determining the outputs of the integrated circuit; **(Page 1424, Section 2, Direct Comparison)**

(D) processing the outputs to determine whether predetermined test criteria are met; **(Page 1424,**

Section 2, Direct Comparison) and

(E) depending on a determination in step (D), generating a new set of test patterns based on the

set of selected test patterns provided in step (A) using a genetic algorithm; **(Page 1424, Section B, GA's)**

and using the new set of test patterns to test the integrated circuit. **(This limitation is an**

Intended Use and is therefore not afforded patentable weight. However see Abstract. Page 1438,

Section D, Circuit Parameters)

Regarding Claim 2:

Yao discloses The method according to claim 37, which comprises:

using, as the system for testing the integrated circuit, an automatic test equipment (ATE); **(Page 1427, Left Column, Evolving Connection implementation)**and

applying the set of test patterns to the integrated circuit via the automatic test equipment. **(Page 1427, Left Column, Evolving Connection implementation)**

Regarding Claim 3:

Yao discloses The method according to claim 2, which comprises implementing the neural network in the automatic test equipment. **(Page 1427, Left Column, Evolving Connection implementation)**

Regarding Claim 4:

Yao discloses The method according to claim 37, which comprises generating the set of test patterns on a random basis. **(Page 1427, Left Column, Random)**

Regarding Claim 5:

Yao discloses The method according to claim 37, wherein step (d) includes adapting inter-unit weights of the neural network through back-propagation. **(Page 1424, Section 2, BP)**

Regarding Claim 6:

Yao discloses The method according to claim 37, which comprises repeating steps (a) to (d) until a level of adaptation in step (d) falls below a given value. **(Page 1423, Section A, Threshold)**

Regarding Claim 7:

Yao discloses The method according to claim 5, which comprises storing data representing

predetermined neural network parameters after terminating a repetition of steps (a) to (d). (Fig. 11.

Partial Training, Further Training)

Regarding Claim 23:

Yao discloses The method according to claim 37, which comprising repeating steps (B) to (E)

until the given test criteria are met. (Fig. 11. Partial Training, Further Training)

Regarding Claim 24:

Yao discloses The method according to claim 37, which comprises repeating steps (B) to (E)

until a condition is met, the condition being selected from the group consisting of meeting the given test

criteria and repeating steps (B) to (E) a given number of times. (Fig. 11. Partial Training, Further

Training)

Regarding Claim 25:

Yao discloses The method according to claim 37, which comprises concluding that the given test

criteria are met if the set of test patterns is associated with an average fitness above a given value. (Page

1430, Left Column, Paragraph 2. Fitness)

Regarding Claim 26:

Yao discloses The method according to claim 37, wherein step (E) includes combining at least

some of the test patterns according to the genetic algorithm in order to provide the new set of test patterns.

(Page 1424, Section B, GA's)

Regarding Claim 27:

Yao discloses The method according to claim 26, which further comprises: selecting test patterns from the set of test patterns according to given selection criteria in order to provide selected test patterns; and combining the selected test patterns according to the genetic algorithm to provide the new set of test patterns. **(Page 1424, Section B, GA's)**

Regarding Claim 28:

Yao discloses The method according to claim 27, which comprises selecting a test pattern if the test pattern is associated with a fitness value greater than a reference value. **(Page 1437, Fitness Estimator)**

Regarding Claim 29:

Yao discloses The method according to claim 27, which comprises selecting a test pattern if the test pattern is associated with a highest fitness value of all unselected test patterns. **(Page 1437, Fitness Estimator)**

Regarding Claim 30:

Yao discloses The method according to claim 27, which comprises selecting a test pattern if the test pattern is associated with a highest fitness value of all unselected test patterns, and repeating the selecting step until a given percentage of test patterns has been selected. **(Page 1437, Fitness Estimator)**

Regarding Claim 31:

Yao discloses The method according to claim 29, wherein step (E) includes: (F) sorting selected test patterns according to an order of associated fitness values; (G) randomly selecting parent test patterns from test patterns as sorted in step (F); and (H) combining selected ones of the parent test patterns. **(Page 1437, Fitness Estimator)**

Regarding Claim 32:

Yao discloses The method according to claim 37, which comprises using at least one element selected from the group consisting a mutation, a crossing over, and a re-combination for the genetic algorithm. **(Page 1424, Section B, GA's)**

Regarding Claim 33:

Yao discloses The method according to claim 37, wherein the step (A) includes providing a plurality of sets of test patterns such that each of the sets of test patterns is included in a test pattern population. **(Page 1424, Section B, Population-Based)**

Regarding Claim 34:

Yao discloses The method according to claim 37, which comprises providing a plurality of test pattern populations and performing steps (B) to (E) for each of the test pattern populations. **(Page 1424, Section B, Population-Based)**

Regarding Claim 38:

See rejection for claim 37.

Conclusion

7.   Applicant's amendment necessitated the new ground(s) of rejection presented in this Office

action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is

reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from

the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing

date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH

shortened statutory period, then the shortened statutory period will expire on the date the advisory action

is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX

MONTHS from the date of this final action.

8.   All Claims are rejected.

9.   Any inquiry concerning this communication or earlier communications from the examiner should

be directed to Saif A. Alhija whose telephone number is (571) 272-8635. The examiner can normally be

reached on M-F, 11:00-7:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor,

Kamini Shah can be reached on (571) 272-22792279. The fax phone number for the organization where

this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application

Information Retrieval (PAIR) system. Status information for published applications may be obtained

from either Private PAIR or Public PAIR. Status information for unpublished applications is available

through Private PAIR only. For more information about the PAIR system, see http://pair-

direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

SAA

March 26, 2007

KAMINI SHAH
SUPERVISORY PATENT EXAMINER